PATENT SPECIFICATION

Application Date: Aug. 7, 1941. No. 10062/41. **559,586**

Complete Specification Left: July 10, 1942.

Complete Specification Accepted: Feb. 25, 1944.

PROVISIONAL SPECIFICATION

An Improved Self-Centering Support for Gun-Barrels

I, SPIRITO MARIO VIALE, a British Subject, of "Lynx House," Burton Road, Littleover, Derby, in the County of Derby, do hereby declare the nature of this invention to be as follows:—

This invention relates to a supporting device for gun-barrels where a certain amount of axial movement is desirable in order to absorb vibration or where momentary displacement due to other causes must be controlled, and has for its object to provide a construction such that any lateral displacement of the part concerned is counteracted by an opposing force which results in a self-centering action.

According to this invention, a support for a barrel comprises a housing containing a plurality of coaxial split-rings whereof alternate rings have their sides wedge-shaped in opposite directions, and an axial spring pressing the wedge-faces together, whereby one set of rings is pressed radially inwards towards the barrel and the other radially outwards towards the housing, and the barrel is thereby centered in the housing.

Preferably, the rings aforesaid are disposed alternately along the barrel, with the outwardly-tapered rings fitting closely to the barrel and the inwardly-tapered rings fitting the housing; it will be appreciated that the outwardly-tapered rings are of smaller internal and external diameter than the corresponding diameters of the inwardly tapered rings, to permit relative displacement transversely of the axis of the barrel.

In a particular construction of this invention, which will now be described by way of example, the part of the gun whereon the barrel is to be supported is provided with a suitable number of longitudinally grooved seatings in each of which a bracket can slide axially. On each bracket there is secured a casing in which a cylindrical housing is mounted. At one end of the housing there is provided an inturned flange and at the other end it is screw-threaded to receive a ring which can be screwed into it.

Within the housing there are mounted the split-rings aforesaid of which the first is located against the inturned flange aforesaid and fits closely to the inner surface of the housing. The internal diameter of this ring is such as to provide a clearance between it and the gun-barrel. One side of this ring is shaped to co-operate with the flange on the housing and the opposite side is bevelled or wedge-shaped so that it faces obliquely inwards towards the gun-barrel. The second ring, which abuts the first ring, is a close fit on the gun-barrel and has one side of it wedge-shaped to co-operate with the wedging surface of the first ring. It will be seen that when axial pressure is applied to these two rings, the first ring is pressed radially outwards and the second ring pressed radially inwards by the wedging action of their abutting faces so that a radially outward load is applied to the housing and a radially inward load to the barrel.

The other side of the second ring is also wedge-shaped, being directed obliquely outwardly so that this ring, in section, tapers outwardly from the barrel. The third ring fits closely inside the housing, as the first ring, and is tapered inwardly like it, but on both sides, and any desired number of these inwardly- and outwardly-tapered rings are provided along the barrel. The last ring of the series is shaped on its outer side to form an abutment for a stiff spring located between it and the ring which is screwed into the end of the housing, and the pressure exerted by this spring wedges all the rings tightly together, pressing one set of rings inwards on the barrel and the others outward in the housing. The gun-barrel is thus held firmly in position relatively to the housing and bracket, and should it be deflected laterally, the loading of the spring ensures a firm support and, at the same time, tends to return the barrel to its central position in the housing. The construction also provides full support for the barrel under the effect of radial and axial expansion

[*Price* 1/-]

due to heat and assists in damping barrel vibrations; it is also self-aligning and is not affected by barrel-deflections.

Dated this 7th day of August, 1941.
BOULT, WADE & TENNANT,
111 & 112, Hatton Garden,
London, E.C.1,
Chartered Patent Agents.

COMPLETE SPECIFICATION

An Improved Self-Centering Support for Gun-Barrels

I, SPIRITO MARIO VIALE, a British Subject, of "Lynx House," Burton Road, Littleover, Derby, in the County of Derby, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to supporting devices for gun-barrels and has for its object to provide a device that will give full support to the barrel both when it is cold and when it has expanded under heat, that will resist lateral deflection of the barrel and align it should it be deflected and that will assist in damping vibration of the barrel.

According to this invention, a support for a gun-barrel comprises a housing containing a plurality of co-axial split-rings whereof alternate rings have their sides wedge-shaped in opposite directions, and an axial spring pressing the wedge-faces together, whereby one set of rings is pressed radially inwards towards the barrel and the other radially outwards towards the housing, and the barrel is thereby centered in the housing.

Preferably, the rings aforesaid are disposed alternately along the barrel, with the outwardly-tapered rings fitting closely to the barrel and the inwardly-tapered rings fitting the housing; it will be appreciated that the outwardly-tapered rings are of smaller internal and external diameter than the corresponding diameters of the inwardly tapered rings, to permit relative displacement transversely of the axis of the barrel.

It has been proposed that packing rings in stuffing-boxes should be wedge-shaped in section, tapering inwardly and outwardly alternately, and should be pressed together by a spring so as to provide a fluid-tight seal between a shaft passing through them and an inner cylindrical wall of the stuffing-box. The present invention does not include any such arrangement but is concerned solely with devices for supporting gun-barrels.

A gun-barrel mounting in accordance with this invention will now be described, by way of example, only, with reference to the accompanying drawing which is a vertical section through the mounting.

The barrel 10 is mounted on a part 11 at spaced points along its length. The rear mounting may take various forms, depending on the design of the gun, but each other mounting is arranged as shown in the drawing.

The mounting shown in the drawing comprises a bracket 12 mounted to slide axially on a longitudinally grooved seating in the part 11. A casing 13 is secured on this bracket and a cylindrical housing 14 is mounted in the casing. One end of the housing 14 is formed with an inturned flange 15 while the other end is screw-threaded to receive a ring 16 which can be screwed into it. Two sets of split-rings 17 and 18 are mounted alternately in the housing. The rings 17 fit closely to the inner surface of the housing and are of larger internal diameter than the barrel to provide a clearance between them and the gun-barrel. Each ring 17 is wedge-shaped in cross-section as shown and the left-hand ring is also shaped to abut the flange 15. Each ring 18 fits closely to the barrel 10 and is smaller in external diameter than the internal diameter of the housing. Each of these rings is also wedge-shaped in cross-section and the right-hand ring has its right-hand face normal to the barrel to provide an abutment for a spring 19 which is compressed by screwing the ring 16 into the housing 14.

The spring 19 presses all the rings 17 and 18 tightly together and causes the outer rings 17 to expand against the housing 14 and the inner rings 18 to contract onto the barrel 10, applying radial loads to the rings. The barrel is supported by the radial loading of the rings 17 and 18 so that it is substantially co-axial with the housing 14 and the radial forces are balanced. The mounting thus provides a self-aligning support for the barrel which support is not affected by radial or axial expansion of the barrel due to heat. Any lateral movement of the barrel in the housing destroys the balance

of the radial forces acting on it so that the unbalanced radial forces act to restore the barrel to its original central position. The mounting will thus assist in damping barrel vibration and will resist deflection of the barrel and tend to restore the barrel to its central position. The mounting provides a firm support for the barrel under all conditions, is self-aligning and is not affected by expansion due to heat or by barrel deflection.

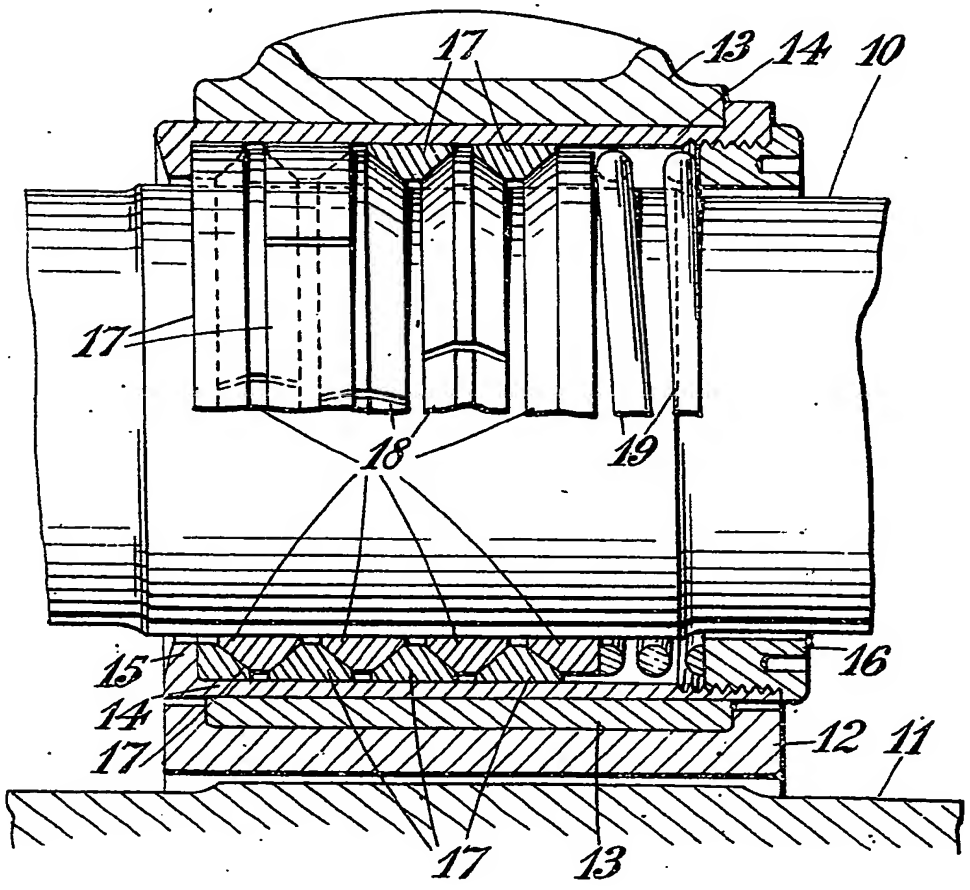
Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A support for a gun-barrel, comprising a housing containing a plurality of coaxial split-rings whereof alternate rings have their sides wedge-shaped in opposite directions, and an axial spring pressing the wedge-faces together, whereby one set of rings is pressed radially inwards towards the barrel and the other radially outwards towards the housing and the barrel is centered in the housing.

2. A support according to Claim 1, wherein the rings are disposed alternately along the barrel, with the outwardly-tapering rings fitting closely to the barrel and the inwardly-tapering rings fitting closely within the housing.

Dated this 10th day of July, 1942.
BOULT, WADE & TENNANT,
111 & 112, Hatton Garden,
London, E.C.1,
Chartered Patent Agents.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.— 1944.



Malby & Sons, Photo-Litho